



The purpose of this brochure is to foster awareness about federal aircraft available for oceanographic research, and to help promote interagency cooperation, coordination, and scheduling of assets.

The National Oceanographic Partnership Program (NOPP) is a collaboration of fifteen Federal agencies to provide leadership and coordination of national oceanographic research and education programs. Established by Congress in fiscal year 1997, NOPP facilitates new interactions among federal agencies, academia and industry, increases visibility for ocean issues on the national agenda, and achieves a higher level of coordinated effort and synergy across the broad oceanographic community.

#### **NOPP Agencies with Participating Aircraft**

Department of Energy  
Federal Aviation Administration\*  
National Aeronautics and Space Administration  
National Oceanic and Atmospheric Administration

National Science Foundation  
Office of Naval Research  
U.S. Coast Guard

\*Not a member of NOPP

#### **Other NOPP Agencies**

Army Corps of Engineers  
Defense Advanced Research Projects  
Department of Homeland Security  
Department of State  
Environmental Protection Agency

Minerals Management Service  
Office of Management and Budget  
Office of Science and Technology Policy  
U.S. Geological Survey

## Department of Energy (DOE)

### Websites:

[http://www.pnl.gov/atmos\\_sciences/as\\_g1.html](http://www.pnl.gov/atmos_sciences/as_g1.html)  
<http://www.arm.gov/docs/index.html>  
<http://www.cmdl.noaa.gov/aero/net/iap/index.html>  
<http://armuav.ca.sandia.gov/armuav.html>



### Mission:

DOE has a small fleet of aircraft to support transportation of sensitive nuclear and hazardous materials, cargo transportation, power line patrol, installation security, multi-spectral photography, airborne environmental research, and passenger transportation. Only aircraft useful for airborne atmospheric or environmental research are mentioned here.

### Platforms:

Most aircraft in DOE's fleet are intensively modified to perform their specialized missions and many are inherently unavailable for other applications. DOE uses a Gulfstream 159 for airborne atmospheric research and, for climate research, a Cessna-172N and various Unmanned Aerospace Vehicles (UAVs).

*Gulfstream 159:* This aircraft is owned by Battelle Memorial Institute and operated for the DOE by the Pacific Northwest National Laboratory in support of DOE's Atmospheric Science Program.

*Cessna-172N:* This aircraft is owned and operated by Greenwood Aviation in support of DOE's Atmospheric Radiation Measurements Program and NOAA's Climate Monitoring and Diagnostics Laboratory.

*UAVs:* Sandia National Laboratories has provided several UAVs and a DeHavilland DCH-6 Twin Otter chase plane in support of DOE's Atmospheric Radiation Measurements program.

### Airborne Sensors:

*Gulfstream 159:* See [http://www.pnl.gov/atmos\\_sciences/as\\_g1.html](http://www.pnl.gov/atmos_sciences/as_g1.html) for details.

*Cessna-172N:* See <http://www.cmdl.noaa.gov/aero/net/iap/instrum.html> for details.

*UAVs:* See <http://armuav.ca.sandia.gov/armuav4.html> for details.

### Scheduling:

*Gulfstream 159:* See [http://www.pnl.gov/atmos\\_sciences/as\\_g1\\_2.html](http://www.pnl.gov/atmos_sciences/as_g1_2.html) for details and access to request forms.

*Cessna-172N:* This aircraft is flown several times per week over predetermined flight patterns above the ARM Southern Great Plains site to altitudes near 3.5 km (11,500 ft).

*UAVs:* Scheduling of UAVs and the DCH-6 chase plane is coordinated by the ARM-UAV program office.

### Contact:

*Gulfstream-159* - Manager, Atmospheric Sciences Technical Group, Pacific Northwest National Laboratory, (509) 372-6158

*Cessna-172N* - Manager, Aerosols and Radiation Program, NOAA Climate Monitoring & Diagnostics Laboratory, (303) 497-6210

*UAVs* - Technical Director, Sandia National Laboratories, California, (925) 294-2203

# Federal Aviation Administration

## Websites:

<http://www.tc.faa.gov/>

<http://www.tc.faa.gov/its/cmd/visitors/data/ACT-300/rdfp.pdf>



## Mission:

The R&D Flight Program, ACB-870, located at the FAA William J. Hughes Technical Center, operates six aircraft of five different types as airborne R&D laboratories. These flying laboratories are equipped, or can be readily modified in-house to support airborne research.

## Platforms:

Boeing 727-25C, Convair CV-580, Beech King Air BE-200, Aero Commander AC-680E, Sikorsky S-76A

## Airborne Sensors:

Numerous project racks have been fabricated for the various aircraft and are available for installation as required. Wing tip smoke generators are available for wake vortices studies. Modern digital avionics and flight control systems permit interfacing with state-of-the-art R&D digital avionics.

## Scheduling:

Contact Manager, FAA R&D Flight Program.

## Contact:

Manager, FAA R&D Flight Program, (609) 485-5581 or (609) 485-6492



# National Aeronautics and Space Administration (NASA)

## Websites:

<http://www.earth.nasa.gov/science/suborbital/>  
<http://cloud1.arc.nasa.gov/>  
<http://www.wff.nasa.gov/~apb/>  
<http://www.dfrc.nasa.gov/airsci/>



## Mission:

NASA's mission is to use aerospace science and technology to explore the universe and search for life, to understand and protect our home planet, and to inspire the next generation of explorers. The agency maintains a variety of aircraft to support its research in aeronautics, microgravity, space transportation, space and earth science. In Earth Science, aircraft are maintained within the Suborbital Science Program to enable earth observations that complement global space-based observations, by providing atmospheric observations with varying vertical and horizontal resolution, targeted observations of regional or ephemeral phenomena, and testbed/virtual satellite simulator capability for new technology sensors.

## Platforms:

ER-2, P3-B, DC-8 are assigned full-time to support Earth Science research and applications investigations. The NASA Earth Science platforms take advantage of NASA's aeronautics expertise to permit complete reconfiguration of the aircraft payloads for each investigation, so that all aircraft deployments are usually unique and focused on changing and interdisciplinary science objectives. NASA also contracts with university and commercial sources for part-time access to various light aircraft, commercial remote sensing services, unmanned aerial vehicles (e.g. Altair, Altus, Pathfinder Plus, etc.), and the Proteus prototype aircraft. NASA verifies airworthiness and safety of all platforms, NASA & non-NASA, when reconfigured for NASA-sponsored earth science research and applications. NASA maintains a number of other platforms for space science, microgravity research and aeronautical research. These other platforms include the WB-57F, B-52, Learjet, Twin Otter, OV-10, B200 KingAir, 747, 757, F-15, F-16, F-18, T-38, C-130, G-I, G-II. They are available on a non-interference basis, but may not be configured for geoscience research.

## Airborne Sensors:

Most sensors flown by NASA are selected through research announcements focused on specific science mission objectives, and may come from university, laboratory, international, industry and federal sources. Numerous sensors are also developed within NASA to demonstrate or prove space measurement concepts, and to provide validation of on-orbit sensors. These NASA sensors are sometimes available on a facility basis, but use must be consistent with agency research goals.

## Scheduling:

Earth science platforms are allocated through an annual process, although requests may be submitted at any time via the Flight Request form available electronically via the Internet: <http://www.dfrc.nasa.gov/airsci/call.html>.

## Contact:

Suborbital Science Manager (for Earth Science platforms),  
(202) 358-0758  
Director, Aircraft Management Office (for other NASA aircraft resources),  
(202) 358-4637



# National Oceanic and Atmospheric Administration (NOAA)

## Websites:

<http://www.aoc.noaa.gov/>

<http://www.oma.noaa.gov/>



## Mission:

The airplanes and helicopters of the Aircraft Operations Center (AOC) are flown in support of NOAA's mission to promote global environmental assessment, prediction and stewardship of the Earth's environment. NOAA's aircraft operate throughout the United States and around the world; over open oceans, mountains, coastal wetlands, and Arctic pack ice. These versatile aircraft provide scientists with airborne platforms necessary to collect the environmental and geographic data essential to their research.

## Platforms:

G-IV-SP, WP-3D, CE-550, DHC-6, AC-690A, AC-500S, LA-25, Bell 212, MD-500D

## Airborne Sensors:

Dropwindsonde (vertical atmospheric soundings) Meteorological sensors for the measurement of temperature, humidity, pressure, winds and fluxes. Rockwell Collins C-band nose radar, Lower fuselage C-band research radar with a 360 deg. horizontal fan beam, X-band tail Doppler research radar. Cloud physics: PMS 2-dimensional and 1-dimensional precipitation and cloud particle probes, PMS Forward and Axially scattering particle probes, Aerosol sampling system, Sea Surface Temperature Radiometer. LIDAR, Hyperspectral, Synthetic Aperture Radar and Airborne Expendable Bathythermograph.

## Scheduling:

Request form available at: <http://www.nmao.noaa.gov/fleettimereq.html>

## Contact:

Aircraft and Program Specifics – Chief, Programs & Projects Staff, (813) 828-3310

Aircraft Request – Chief, Program Services and Outsourcing Division, (301) 713-1045



NOAA, NASA and U.S. Air Force Reserve aircraft fly into hurricanes at different altitudes to collect data on the storm.

# National Science Foundation (NSF)

## Websites:

<http://www.geo.nsf.gov/atm/>  
<http://raf.atd.ucar.edu/Aircraft/>  
<http://www.geo.nsf.gov/atm/ulafos/laof/iccagra.htm>  
<http://www.hiaper.ucar.edu/>  
[http://atd.ucar.edu/dir\\_off/OFAP/info/requestProcedures.html#request](http://atd.ucar.edu/dir_off/OFAP/info/requestProcedures.html#request)



## Mission:

NSF maintains aircraft to support research and education in the atmospheric and oceanographic sciences such as: 1) long-range observations over remote tropical and oceanic regions critical to studies of the global climate; 2) studies of the kinematic and thermodynamic structure of the troposphere (including boundary layer studies); 3) studies of atmospheric chemistry and aerosols in the troposphere; and 4) cloud physics including penetration of convective clouds.

## Platforms:

*EC-130Q*, *G-V HAPER* (High Performance Instrumented Airborne Platform for Environmental Research – available in 2005)

*King Air*: operated as a National Facility by University of Wyoming

*T-28 Storm Penetration Aircraft*: operated as a National Facility by the South Dakota School of Mines and Technology

## Airborne Sensors:

NSF and university aircraft have full suite of atmospheric sensors. PIs may bring instruments to integrate into the aircraft for specific scientific missions.

## Scheduling:

All scientific proposals must be submitted via Fastlane at: <https://www.fastlane.nsf.gov/fastlane.jsp>

## Contact:

NSF Facilities Coordinator, (703) 292-8521

Director, Atmospheric Technology Division, NCAR, (303) 497-8833



Photo left: composite by Tom Warner



## Department of Defense, Office of Naval Research (ONR)

### Websites:

<http://www.onr.navy.mil/>  
<http://web.nps.navy.mil/%7Ecirpas/>  
[http://www.onr.navy.mil/sci\\_tech/ocean/projects/res\\_platforms.htm](http://www.onr.navy.mil/sci_tech/ocean/projects/res_platforms.htm)



### Mission:

The Research Facilities Program manages, under a charter party agreement with selected universities, the operation and maintenance of all oceanographic research vessels owned by ONR for Department of the Navy. As part of the management of the ONR fleet, the program actively supports fleet modernization to maintain the level of excellence that is required to support cutting edge oceanographic research. Other oceanographic platforms such as unmanned underwater vehicles, aerial unmanned vehicles may be used to collect field data through the Research Facilities Program.

### Platforms:

Altus ST UAV Remotely Piloted aircraft, Pelican OPV (Optionally Piloted aircraft) highly modified Cessna 337/O-2A Skymaster UV-18A Twin Otter, Predator UAV

### Airborne Sensors:

CIRPAS possesses a variety of scientific instruments and instrument suits. The basic meteorological and GPS suite consists of a Rosemount temperature probe, a Edgetech chilled mirror dew point sensor, a Rosemount flow angle probe with static ports, Vaisala temperature and dew point sensors, Eppley radiometers (total solar, partial solar, infrared, and UV), a Novatel GPS receiver with a ground survey station for differential correction, a TANS Vector GPS attitude system, a C-Midget-II INS-GPS system, an IRGA humidity and carbon-dioxide sensor, and an Aerodyne fast absolute humidity sensor. The CIRPAS aerosol instrumentation suite consists of a TSI 3-color nephelometer, a Radiance soot photometer, a TSI Ultrafine particle counter, and a TSI condensation nuclei counter. The CIRPAS cloud and particle instrumentation suite consists of an FSSP-100, a PCASP-100X, both with upgraded electronics, a CAPS scatter and occultation probes, and DMT 2D-P and 2D-PP probes, a TSI aerodynamic particle spectrometer, and a MOUDI Impactor. A new cloud radar, and a new wind lidar are near completion. The CIRPAS mobile calibration laboratory is equipped with temperature, dew point, and pressure calibrators, DMA aerosol classifier systems for generation of particle size and concentration standards, integrating sphere for radiometer calibration, various tools and test equipment.

### Scheduling:

Director CIRPAS for scheduling

### Contact:

Director CIRPAS, (831) 384-2776  
ONR Program Officer, (703) 696-4530



# United States Coast Guard (USCG)

## Websites:

<http://www.uscg.mil/uscg.shtm>  
<http://www.uscg.mil/deepwater/>  
<http://www.uscg.mil/datasheet/dataindx.htm>  
<http://www.uscg.mil/lantarea/iip/iipocean.html>



## Mission:

The USCG operates a specialized fleet of helicopters and fixed-wing aircraft to support missions such as search and rescue, law enforcement, marine safety, environmental response, ice operations, aids to navigation, and boating safety

## Platforms:

*HC-130 Hercules:* All-weather, day and night airlift/airdrop, and surveillance platform. Capable of ramp-deployed aerial delivery with ranges exceeding 4,000 nautical miles with loads of up to 40,000 pounds.

*HU-25 Guardian:* Medium-range reconnaissance jet. The Falcon is capable of rapid deployment with aerial delivery of rescue equipment and a maximum range of approximately 1,800 nautical miles. The Falcon is also a suitable MEDEVAC aircraft for ambulatory patients and incubators.

*HH-60 Jayhawk:* Medium-range recovery (MRR) aircraft equipped with rescue gear, hoists, and external suspended-load attachment points. The Jayhawk is capable of landing or deploying aboard compatible ships and is currently being equipped for armed response capabilities.

*HH-65 Dolphin:* Short-range recovery (SRR) rotary-wing aircraft, equipped with rescue gear, hoists and external suspended attachment points. The Dolphin is currently being configured for armed response.

*MH-68A:* Short-range interdiction rotary-wing aircraft used for aerial armed response for counter-drug and Maritime Homeland Security.

## Airborne Sensors

HC-130's and HU-25's are equipped with various sensors to include infrared and electro-optical. APN-215 (weather radar), APS-137 ISAR (Inverse Synthetic Aperture Radar), and SLAR (Side-Looking Airborne Radar). The Coast Guard's rotary-winged aircraft, the HH-60 and HH-65, are outfitted with RDR-1300C, which is used for surface search, weather avoidance, and ground mapping. FLIR devices as well as still and video cameras (hand held) may also be found aboard some aircraft.

## Scheduling:

Contact Marine Science Advisor

## Contact:

Marine Science Advisor, (202) 267-1457

